Remarks

In response to the Office Action mailed July 3, 2003 claim 8 is amended. Claims 1-7 and claims 21-40 were previously cancelled, without prejudice, pursuant to a restriction requirement.

Applicants' invention is directed to microwave vacuum tube devices and, in particular, gridded microwave tube types. The device comprises a substrate, a cathode, attached to the substrate, a grid attached to the substrate and an output structure. The cathode and grid are substantially parallel. One or both of the cathode and grid are attached to the device substrate by flexural members. In the operation of the device, a weak microwave signal to be amplified is applied to the grid. The signal applied to the grid controls the number of electrons flowing between the cathode and the anode. The voltage on the grid controls the flow of current. As this current passes through an external load, it produces a large voltage, and the gridded tube thereby provides gain. See page 10, line 22 to page 11, line 2 of applicants' specification. Thus, in applicants' device the grid is configured to modulate the electrons drawn from the cathode. Applicants' device is inherently at least a three terminal device (i.e. one terminal for the cathode, a second for the anode and third for the grid) and is easily extended to more than three terminals (by using multiple grids).

The Examiner rejected claims 8-20 under 35 U.S.C. § 102(b). The Examiner cites US Patent No. 5,536,988 to Zhang (Zhang hereinafter) as the basis for this rejection.

Zhang is directed to a process for making field emission devices. Although Zhang describes a device having both a grid and a cathode attached to a substrate, Zhang does not describe a device in which the grid modulates the electrons drawn from the cathode. The grid (282) in Zhang is merely a support structure and provides no modulating function.

Applicants have amended claim 8 to specify that the grid is configured to modulate the electrons drawn from the cathode. Support for this amendment is found on page 10, line 23 to page 11, line 6 of applicants' specification. This feature is clearly not disclosed or suggested by Zhang. Since Zhang does not disclose or suggest a gridded microwave tube device wherein the grid is configured to modulate the electrons drawn from the cathode, Zhang clearly does not anticipate applicants' amended claim 8.

Nor does Zhang render obvious applicants' invention. Zhang only describes emitters. Zhang does not disclose modulated microwave devices. There is nothing in Zhang that could be construed to suggest that the grid described therein perform a modulating function. For this reason, Zhang does not render obvious claim 8.

The Examiner also rejected claims 9-20 as anticipated by Zhang. Claims 9-20 depend from claim 8. Therefore, claims 9-20 are not anticipated by or rendered obvious in view of Zhang for the aforesaid reasons, because they depend from claim 8. In addition, certain of these claims recite features that are not disclosed in or suggested by Zhang. The following are additional arguments that support the patentability of claims 9-20.

With regard to claim 10 and 11, these claims state that the cathode and grid surfaces are substantially perpendicular to the device substrate. Because the grid and the cathode are substantially parallel to each other, but perpendicular to the substrate, the electrons travel parallel to the substrate. In Zhang, the electrons travel perpendicular to the substrate (See FIG. 8(e)) because the emitters are configured to provide electron flow perpendicular to the substrate. Thus, from an emission perspective, Zhang describes a cathode surface that is substantially parallel to the substrate in order for the device to provide electron flow in a direction perpendicular to the substrate. Since the grid and cathode are parallel to each other, but perpendicular to the substrate, the parasitic capacitance with the substrate in the present invention is reduced compared with the configuration described in Zhang. This makes the present invention better suited to high frequency applications than the Zhang structure.

With regard to claims 12 and 13, the Examiner asserts that these claims, which further describe the output structure of claim 8, are also anticipated by Zhang. The Examiner failed to appreciate that Zhang describes field emission cathodes (22) only. As such there is no anode structure in Zhang.

With regard to claim 14, that claim recites additional grids attached to the substrate by one or more flexural members. Although the Examiner asserts that Zhang describes multiple grids, the applicants submit that Zhang provides no such disclosure. In Zhang, the grid is formed in single crystal silicon. In the fabrication process described by Zhang, forming more than one additional grid is not possible.

With regard to claim 15, that claim recites the use of carbon nanotube emitters. Zhang describes silicon nanometer emitter structures. The structures are not nanotubes and certainly not carbon nanotubes. Claim 15 is clearly not anticipated by Zhang for this reason.

With regard to claims 16 and 17, these claims recite surface area of the cathode and spacing between cathode and grid, respectively. With regard to claim 16, Zhang does not describe the surface area of the cathode or grid. With regard to claim 17, Zhang merely states that the oxide thickness on the wafer is 500 nm. The Examiner seems to infer that this oxide thickness will define the distance between the grid and the cathode. A cursory inspection of the process flow described in Figures 4a -4j reveals that this is not the case. The oxide layer 240 is patterned and the remaining portion of 240 (Fig. 4b) is used as a mask for pattern transfer into the underlying silicon substrate. Contrary to the Examiner's assertion, the cited portion of Zhang (and indeed the entire Zhang disclosure) does not describe a distance between the grid and the cathode. The only dimensions described in Zhang are the thickness of layers used to form the support structure on which the emitters are formed. Zhang does not disclose or suggest a distance between the cathode and the grid.

With regard to claim 18, that claim specifies a number of gridded microwave devices with three or more terminals. Zhang does not disclose a device with three or more terminals and therefore the devices specified in claim 18 (i.e. a triode device, a tetrode device, a pentode device, a klystrode device, a traveling wave device, or a klystron device). As previously noted, Zhang describes emitters only. As such, there is no anode in the Zhang devices. In direct contrast to Zhang, applicants' invention specifies a device with at least three terminals (i.e. one for the cathode, one for the anode and one for the grid). Therefore, Zhang does not describe a device with three or more terminals, such as the devices recited in claim 18.

In conclusion, applicants again state that claims 9 through 20 are not anticipated by Zhang for the same reasons that amended claim 8 is not anticipated by Zhang. Additional reasons why certain dependent claims are not anticipated by Zhang are also provided above.

In view of the foregoing arguments and amendments, applicants submit that claims 8-20 are in condition for allowance. Favorable action is respectfully requested.

Respectfully submitted,

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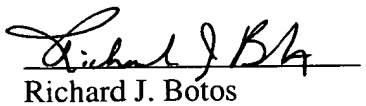

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APPENDIX B (continued)
Transferred Patents

Cas Name	Filing Dat	Issue Date	Patent N .	Serial No.
Fritzinger 8-1-1-1	1/20/1998		09/009399	
Fritzinger 9-5-2-5-14	11/23/1999			09/447893
Frye 23-4-61	3/2/1999			09/261093
Frye 25-1	8/4/1999	8/1/2000	6097273	09/366841
Fryer 1-1	10/12/1999	8/22/2000	6107789	09/416033
Fryer 2-2	10/12/1999			09/416464
Fuehrer 2-9-24-11	11/16/1998			09/192651
Fulmer 1-1-1-1-7	1/31/2000			09/495154
Fulmer 2-1-1	1/10/2000			09/480014
Gabara 39-48	4/9/1997		08/838536	
Gabara 44-8-11	4/23/1998		09/065255	
Gabara 45	5/29/1998		09/087538	
Gabara 47	5/22/1998		09/083172	
Gabara 48	8/14/1998		09/134602	
Gabara 49-5	6/29/1998		09/106284	
Gabara 51	8/25/1998	8/8/2000	09/139300	6100743
Gabara 52	9/24/1999			09/405247
Gabara 54	12/28/1998			09/221264
Gabara 57-5	9/29/1998		09/162852	
Gabara 58	9/29/1998		09/162851	
Gabara 59	10/13/1998			09/170165
Gabara 61	12/28/1998			09/221263
Gabara 62	8/25/1998		09/139299	
Gabara 67	1/26/1999			09/236675
Gabara 69-1	11/10/1999			09/437273
Gabara 72-12	5/14/1999			09/311589
Gabara 73-1	8/13/1999			09/374258
Gabara 74-13	7/29/1999			09/363524
Gabara 75-12-3	6/7/2000			09/589391
Gabara 76-3-14-66	11/29/1999			09/450524
Gabara 77	12/1/1999			09/452611
Gabara 79	8/25/2000		09/648162	
Gabor 1-21-16	3/12/1999			09/268448
Galvin-Donoghue 6-3	9/18/1995		08/529775	
Gammel 13-56	3/26/1999			09/280804
Gammel 18-47-1-57	8/30/2000		09/651696	
Garcia 1-2	3/16/2000			09/527010
Garner 6-3	5/4/1998	4/18/2000	6052030	
Gaudet 1	4/13/1999			09/290764
Gaudet 2	4/13/1999			09/290603
Genetti 1-1	3/17/2000			09/528071
Geva 5-1-3-20	3/31/2000			09/540474
Giannuzzi 2-13-7	5/9/2000			09/567675
Giannuzzi 3-19-12	5/9/2000			09/567373
Giannuzzi 4-20-13	5/9/2000			09/567359
Gibson 3-12-2-16-10	8/30/1999			09/385713
Gibson 4-13-3-17-11	8/30/1999			09/385714
Gibson 6-28-5-20-15	5/18/2000			09/575214
Glas 2	9/25/1998		09/161164	
Glas 3-6	12/23/1998	4/11/2000	6049248	09/220980
Glogovsky 4	11/5/1998	02/29/00	6030903	
Glogovsky 5	8/3/1999	8/22/2000	6107110	09/366250
Gloudemans 2-1-1	12/2/1998			09/203974
Goeddel 10-7-12-1-7	6/10/1999			09/329399
Golden 16-5-11-24	5/2/1997		08/850896	
Golden 17-6-12-25	5/2/1997		08/850738	
Goldovsky 1-17	5/15/1998		09/079642	
Goldovsky 2-20	8/20/1998		09/137390	
Goldovsky 5-12	3/15/2000			09/525644
Goldovsky 6-1	5/11/2000			09/569022